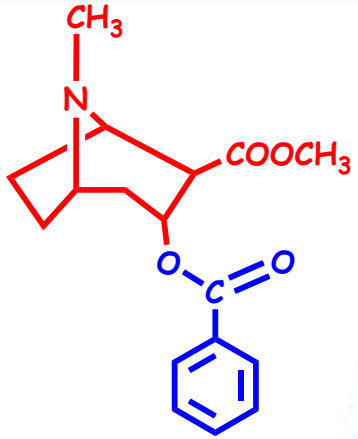
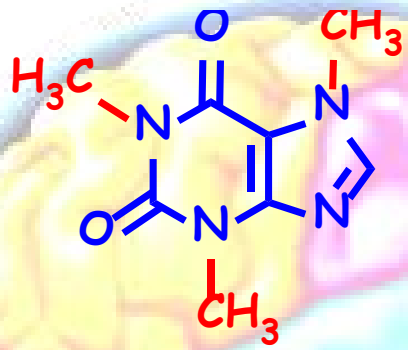
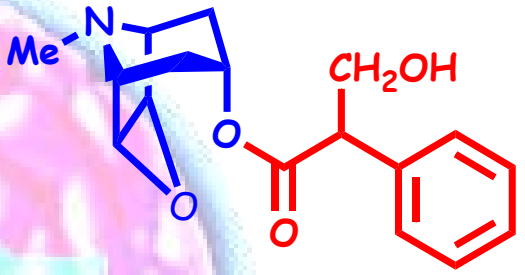
# Botany & Medicinal Plants



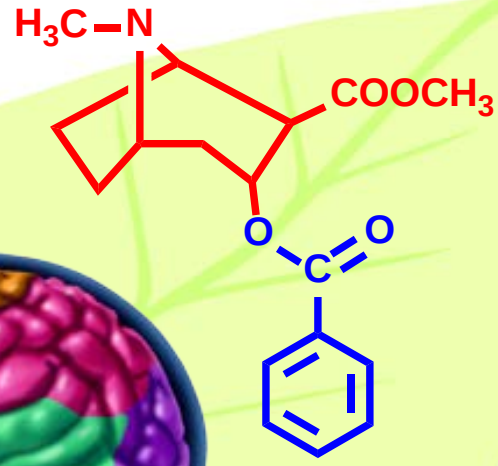




Cairo University
Faculty of Pharmacy

# Leaves Acting on CNS

Dr. Omar Sabry

# Coca Leaves ورق الكوكا




# Coca Leaves ورق الكوكا

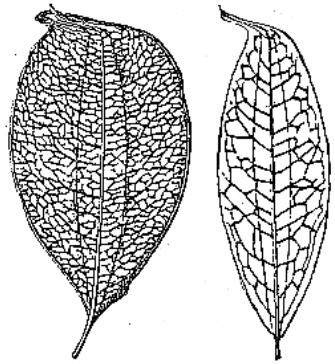
## Origin

**Dried leaves of *Erythroxylum coca* known as Bolivian coca or *Erythroxylum truxillens* known as Peruvin *coca* Family Erythroxylaceae.**

**Erythroxylon 'erythros', 'red' and 'xylon'. 'wood'.**

**Coca Quechua, 'kúka', 'food for workers '.**

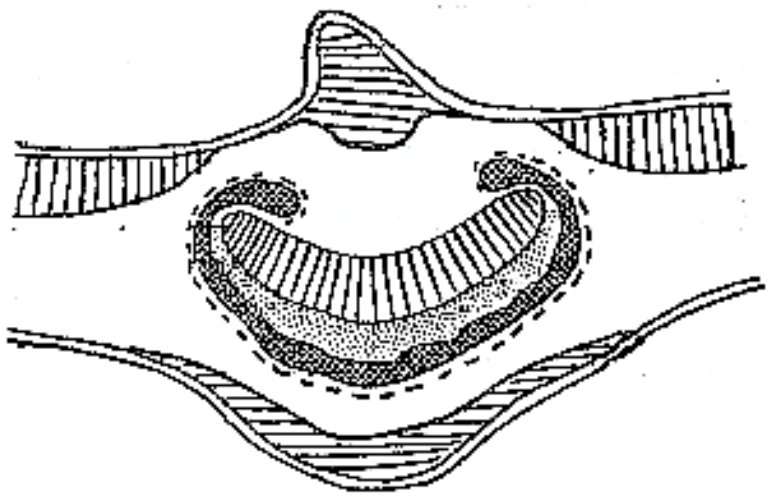
**Bolivian coca**



**Peruvin *coca***

# Coca Leaves ورق الكوكا

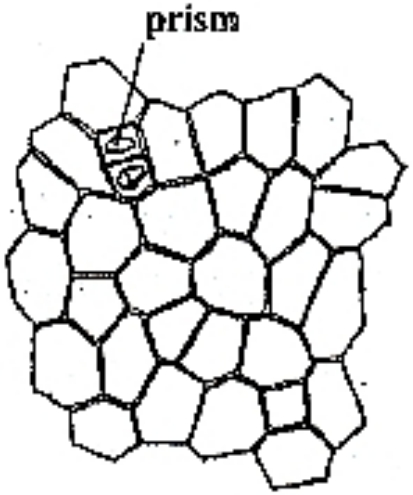
## T.S. القطاع العرضي

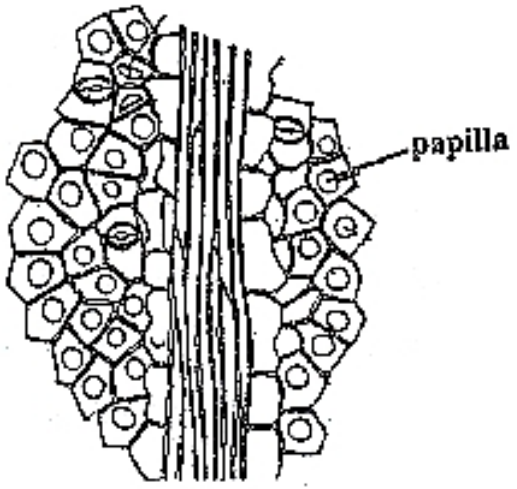


- **The leaf is dorsiventral.**
- **Collateral vascular bundle .**
- **Crystal sheath.**

# Coca Leaves

## Surface Preparation




**Upper epidermis**

**No stomata**

**Lower epidermis**

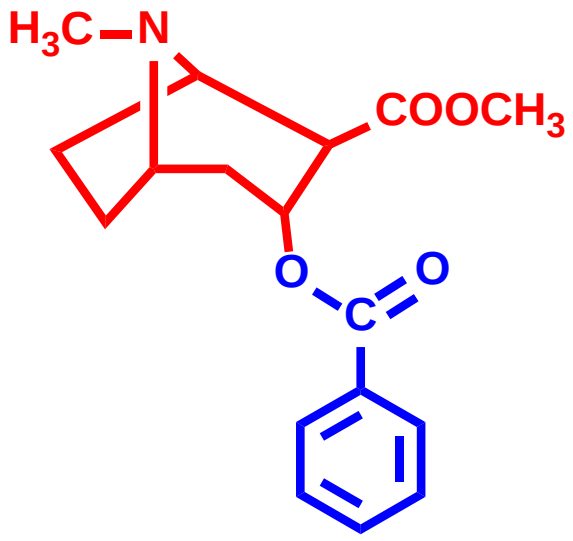
**Paracytic stomata**

# Coca Leaves

## ACTIVE CONSTITUENTS

**1- Alkaloid (Cocaine) less than 1%.**

**Bolivian coca contains more cocaine than Peruvian coca.**




**2- Other alkaloids like: Cinnamylcocaine**

# Coca Leaves

## USES

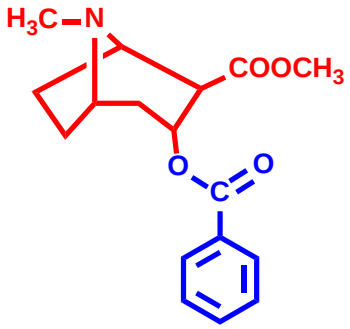
- Hallucinogenic

- Hypodermally produce local anesthesia -

- (Minor ophthalmic, ear, nose and throat surgery).

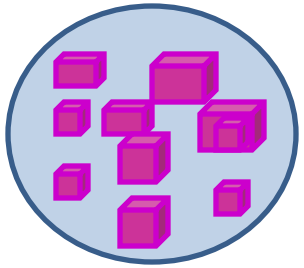
# Coca Leaves

## Test for Cocaine




## $KMnO_4$ Test

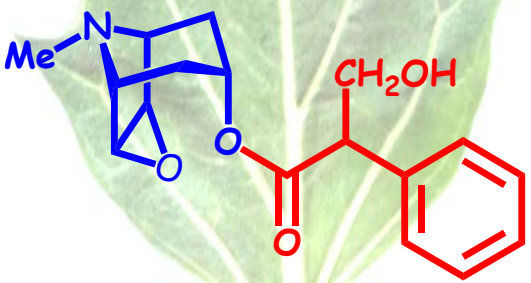
- Cocaine + 0.02 N HCl ⟶ evaporate.
- Dissolve in few drops of water
- Add 0.1 N $KMnO_4$ solution ⟶ violet crystalline ppt.
- Under microscope violet-red cubic aggregates.

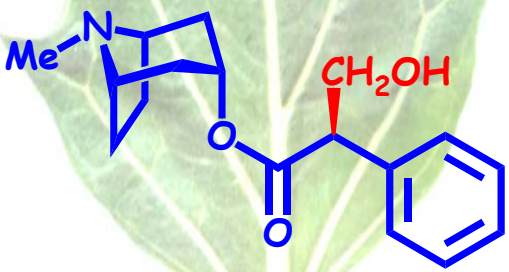


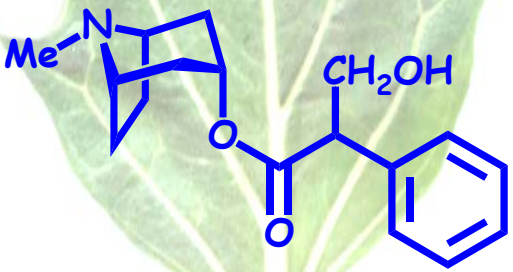
# HYOSCYAMUS LEAVES

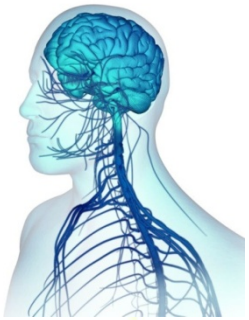
# FOLIUM HYOSCYAMI

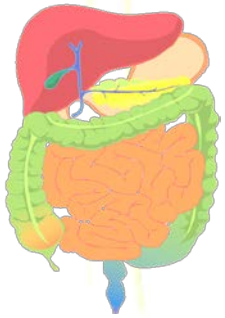
## ورق السكران

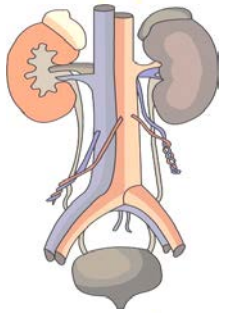






# EGYPTIAN HENBANE
# *Hyoscyamus muticus* Leaves
# أوراق السكران المصرى

## Botanical origin

**Dried leaves with or without the flowering tops of *Hyoscyamus muticus*. Family Solanaceae.**

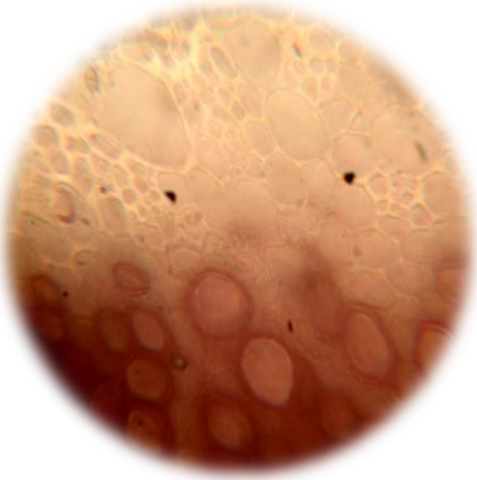
- **Hyoscyamus harmful to hogs (pigs).**
- **The plant is poisonous to swine (pigs).**
- **Henbane harmful to chicken**

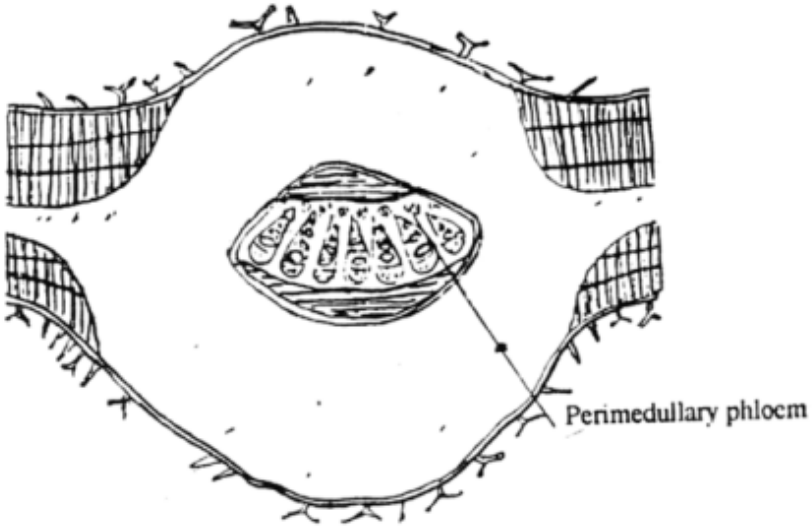
- **Part used: leaves and flowering tops.**

# Microscopical examination

## The T.S. shows

- The lamina is iso-bilateral, the palisade of the lower side being composed of shorter cells than that of the upper.





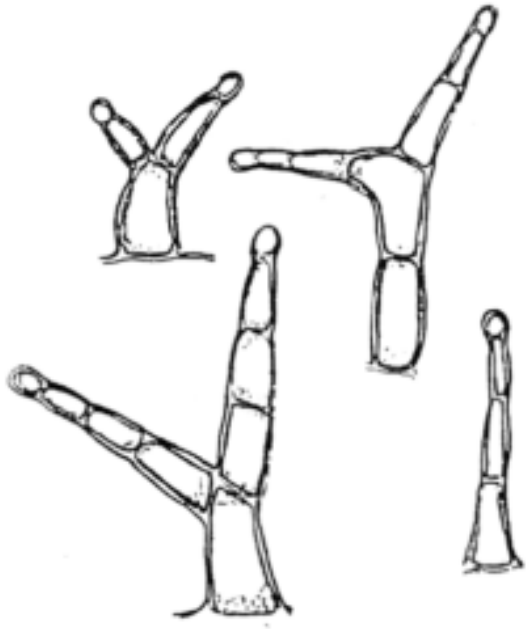

- Collateral vascular bundles with collenchymat. pericycle and perimedullary phloem.

# Microscopical examination

- Cuticle is often striated near the base of hairs.

- The trichomes are usually branched.

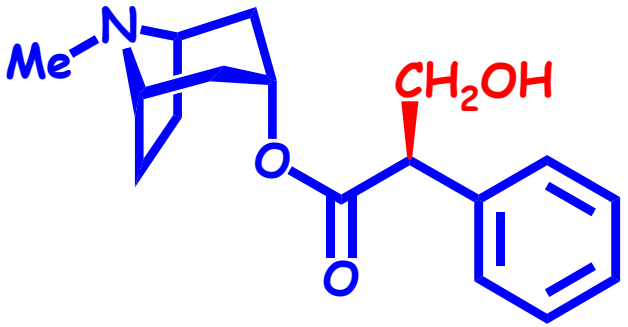
- Each branch terminating in a unicellular, sub-spherical gland.



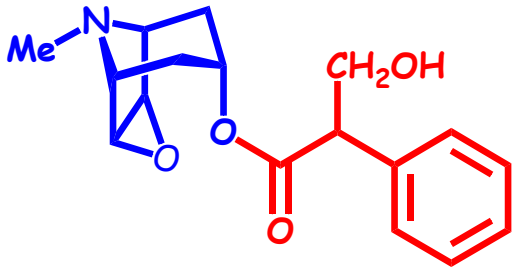
# Active constituents

- 0.7 to 1.5 percent of total alkaloids:

- Hyoscyamine (Crystalline).



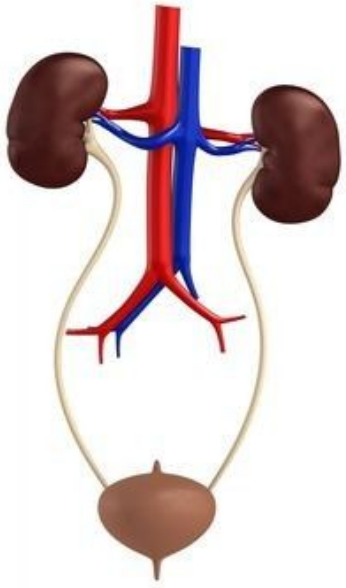

- Scopolamine (Hyoscine) amorphous alkaloid.



# Action and uses

1- Hallucinogenic

2- To check vesical (urinary bladder) spasm in urinary incontinence.

3- As sedative in cystitis and gonorrhoea.

# Action and uses

4- Relieve the griping action of some purgative.

6- Motion sickness.

5- Enhance the hypnotic effect of morphine.

7- Parkinsonism.

# European Henbane السكران الاوروبي

## Botanical origin

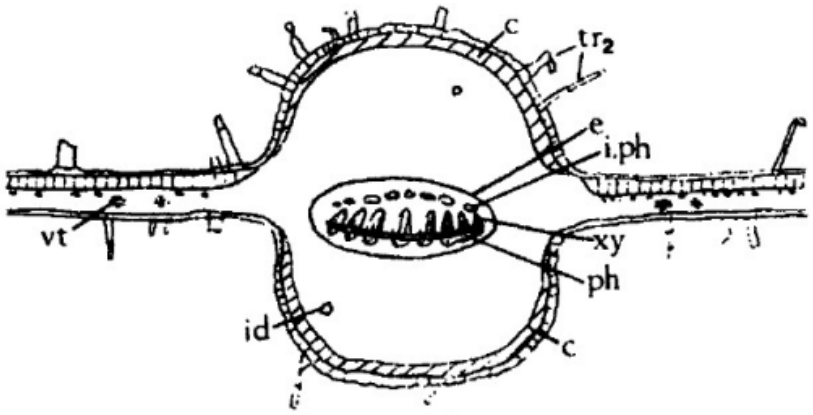
**Dried leaves with or without flowering tops of *Hyoscyamus niger* Family Solanaceae.**

**Part used: leaves and flowering tops.**

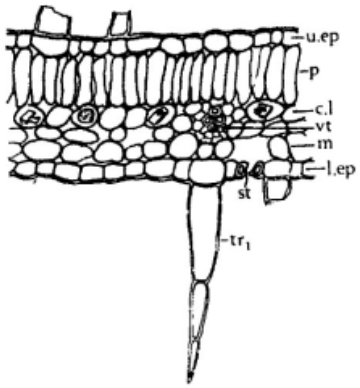
# Microscopical examination

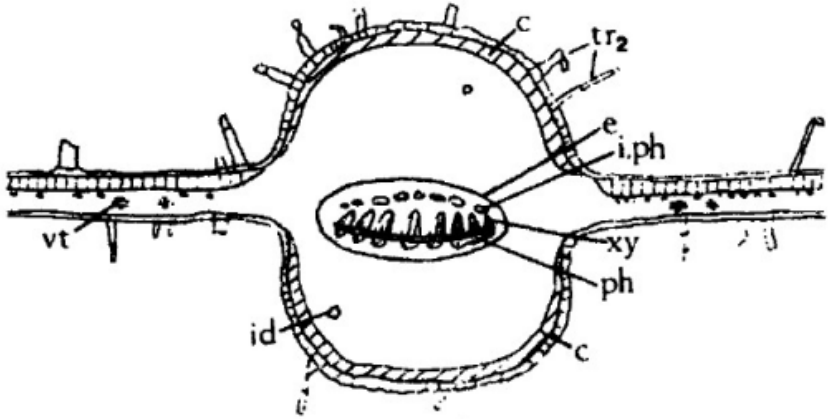
## The T.S. shows

- Dorsiventral leaf.




- The parenchyma cells contain single prisms, crystal layer prisms, twin crystals of calcium oxalate

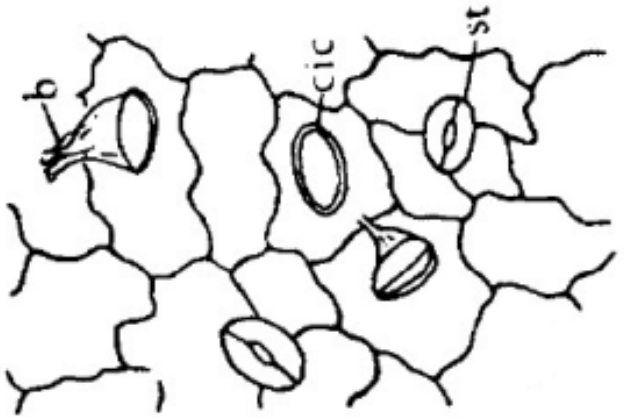



- Crescent shaped collateral vascular bundles.

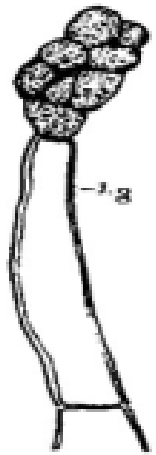
# Microscopical examination

- Smooth cuticle and sinuous anti-clinal walls.



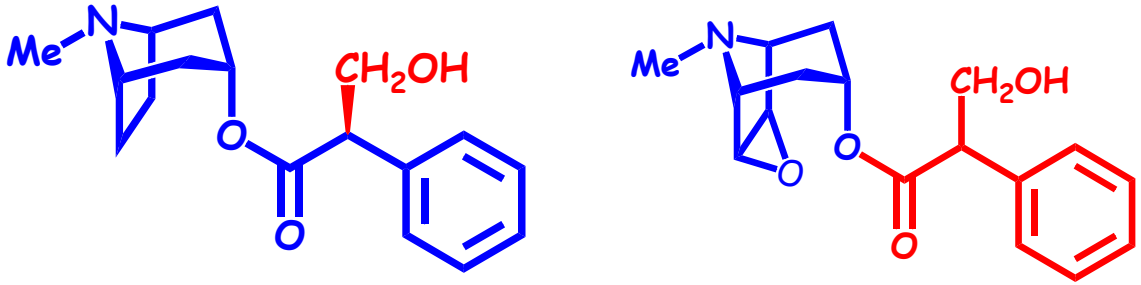
- The stomata are anisocytic

- Glandular hairs two to six cells uni-seriate stalk and an ovoid multi-cellular glandular head.



# Active constituents

- Hyoscyamine and Scopolamine (Hyoscine).




- Total alkaloid present is about 0.045 to 0.14%.

- The percentage of alkaloids depends on the altitude and the age of the leaf.

- Mature leaves are richer in hyoscyamine than hyoscine; tender leaves are relatively richer in hyoscine.

- Hyoscyamus contains ↑ % of alk. in summer.

# Action and uses

1. Hallucinogenic.

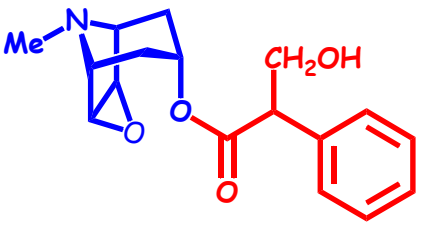
2. Sedative.

3. Relieves the griping caused by purgatives.

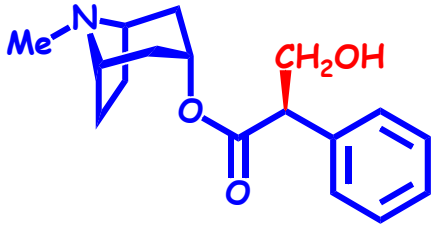
4. Hyoscine in control of motion sickness.

5. Hyoscine hydrobromide mydriatic actions shorter duration of action than atropine.

# Test for Alkaloids




## Vitali Morin Test
## Vitali's test

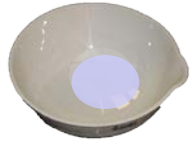



- One ml alkaloidal solution evaporated on a water bath → Residue

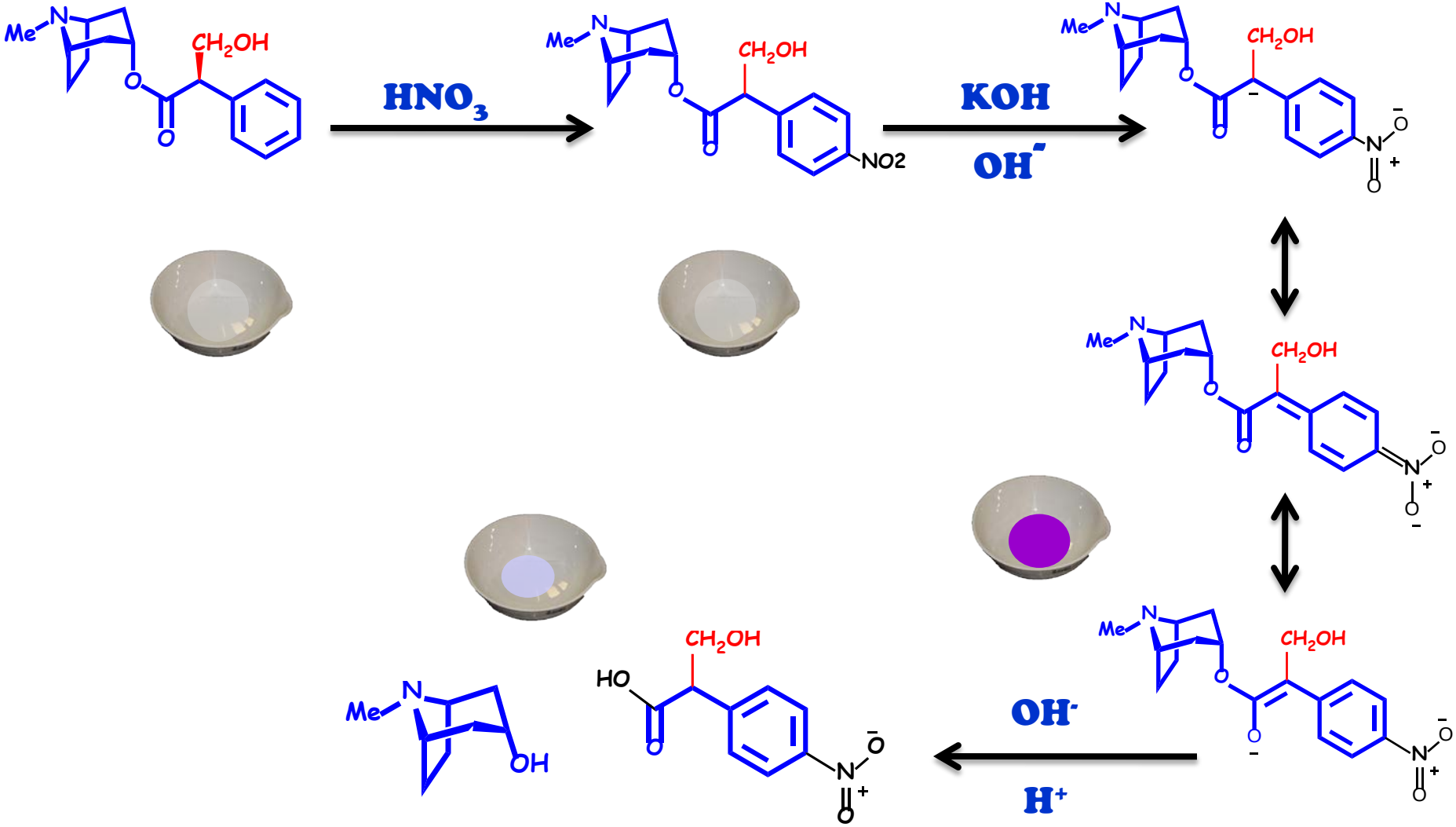
- 2-5 drops of $HNO_3$ → No color.

- Evaporate to dryness

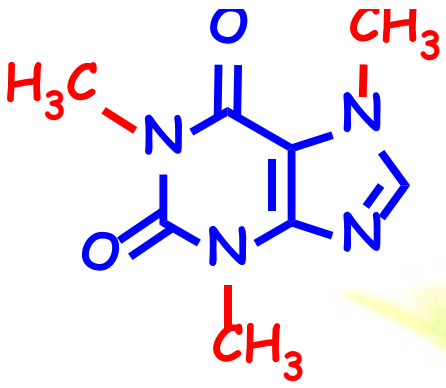
- Few drops of alcoholic KOH → a violet color fades gradually by time.

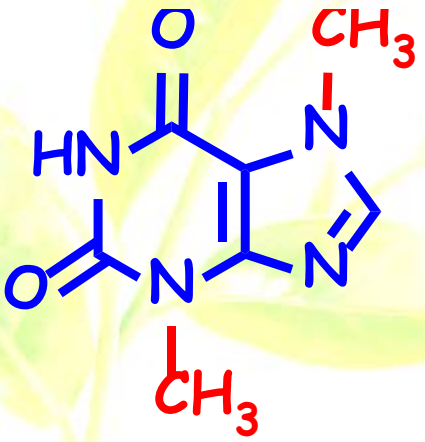


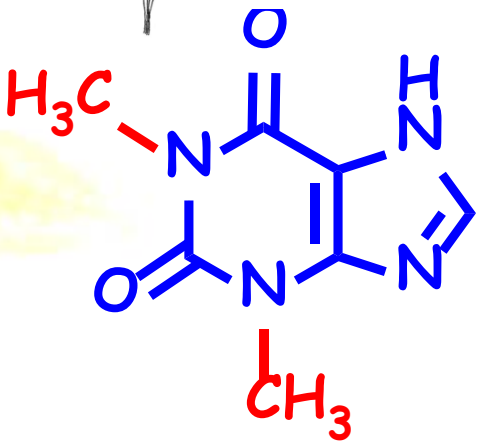
# Vitali Morin Test



# Tea Leaves



# Tea Leaves

## Origin

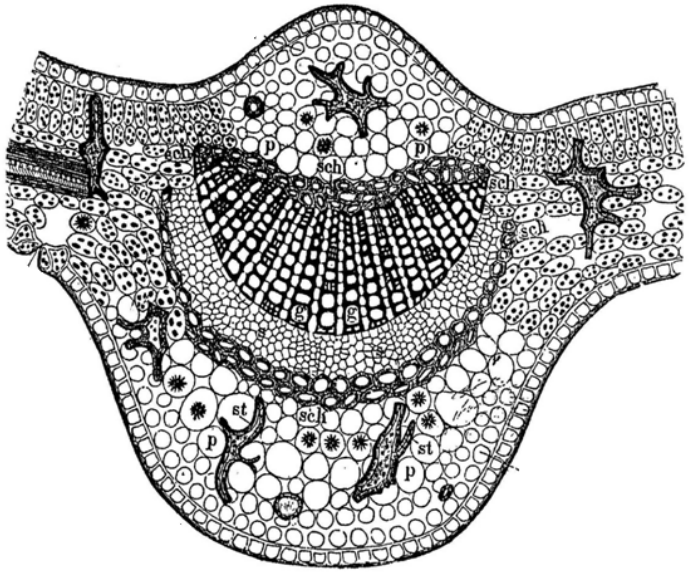
- Prepared leaves and leaf-buds of ***Camellia sinensis*** (Thea ***sinensis)*** Family Theaceae.

- **Thea** in Greek means goddess;
- ***sinensis*** refers to China.
- ***Camellia*** refers to George **Kamel**

# Microscopical Characters

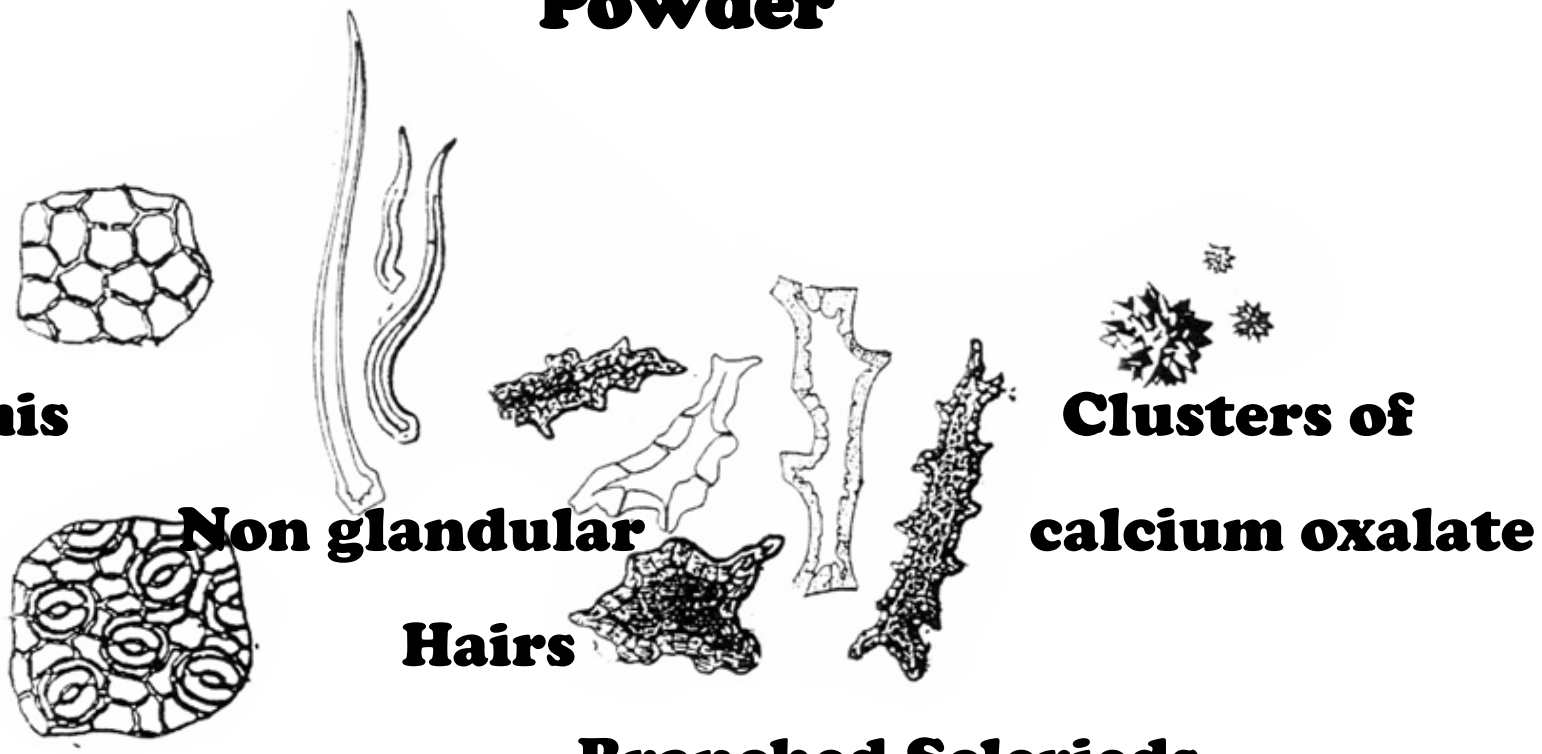
## T.S

- The leaf is dorsiventral.
- lignified numerous branched sclereids.
- Collateral vascular bundle.

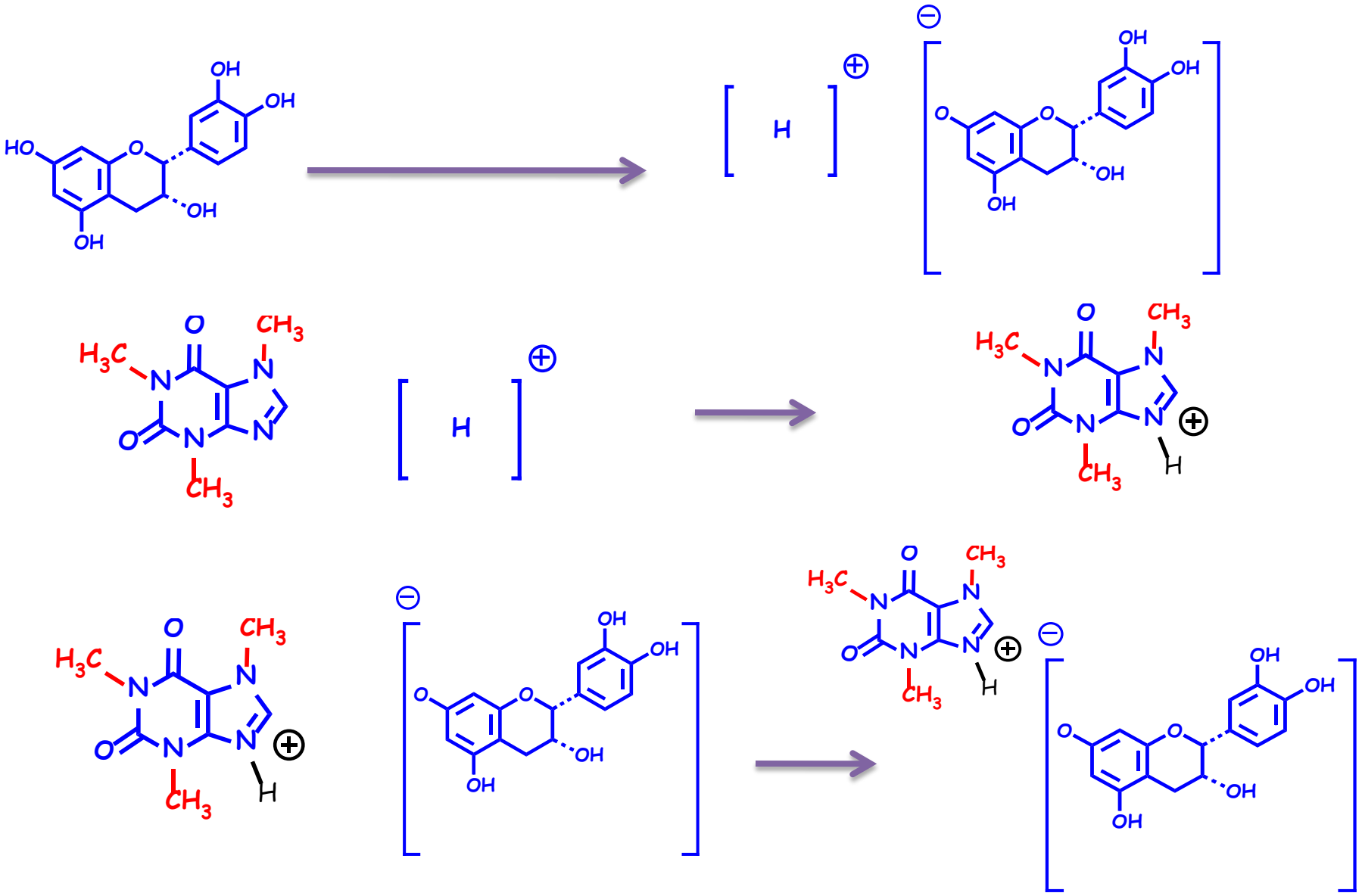


# Tea Leaves

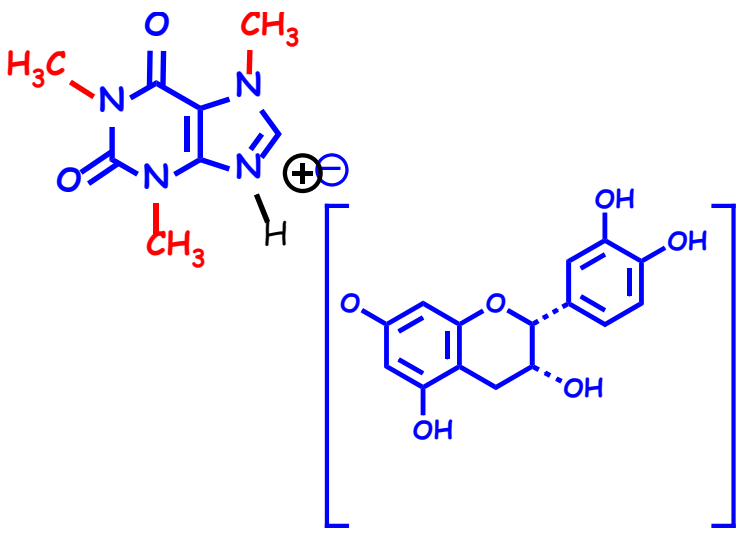
## Powder



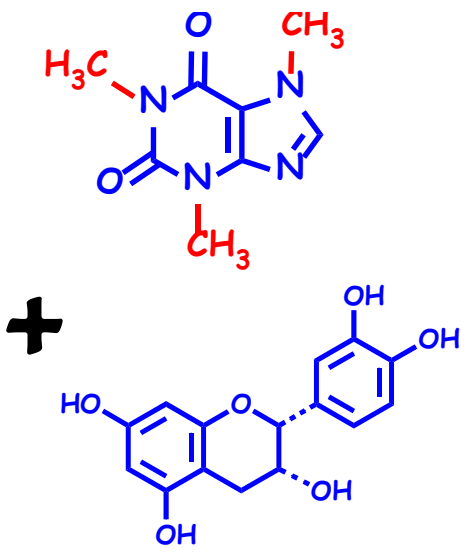
# Caffeine tannin complex

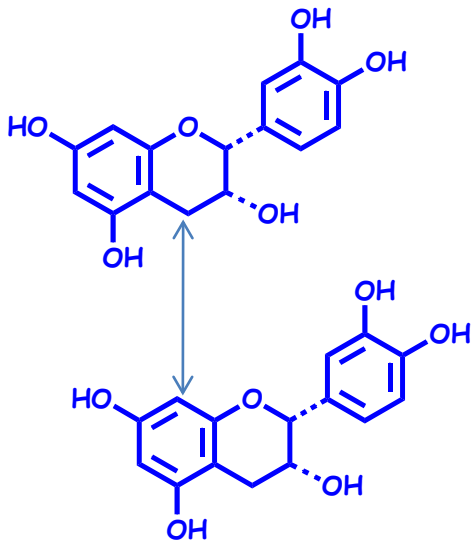


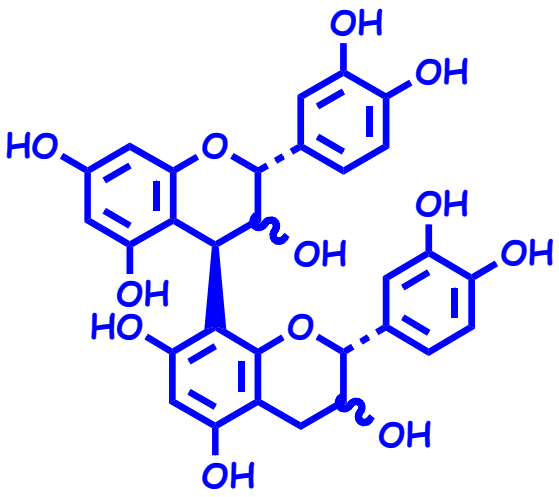
# Free Caffeine + tannin



**Thease enzyme**





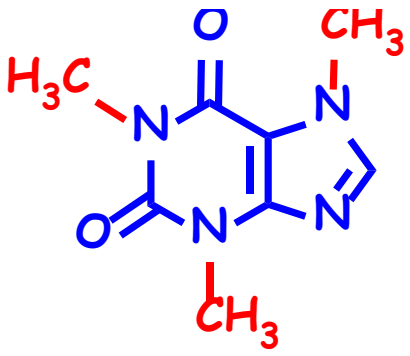


# Tea Leaves

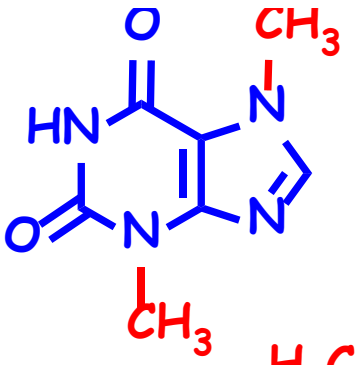
## Active constituents

### 1- Alkaloids

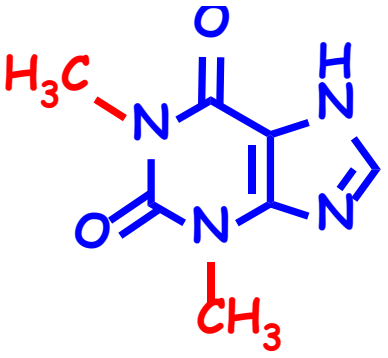
**Caffeine {theine}**



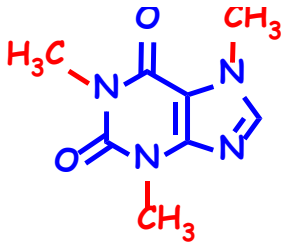

**Theobromine**

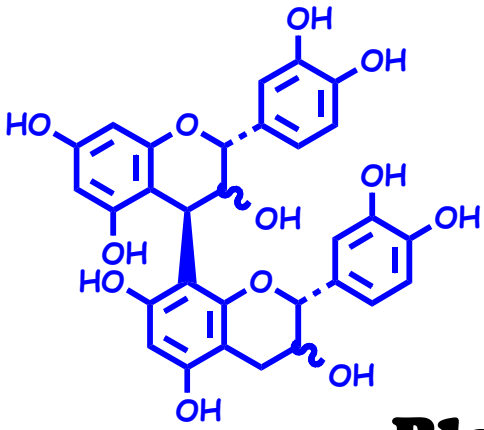


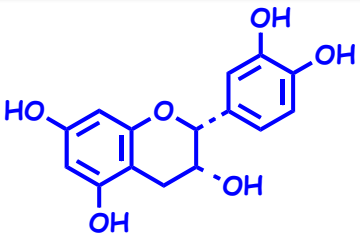

**Theophylline**



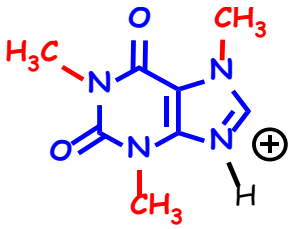
# Tea Leaves

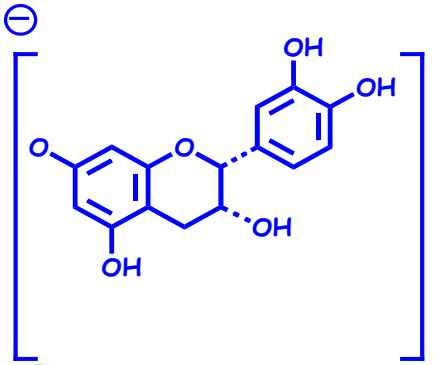






Epi-catechin





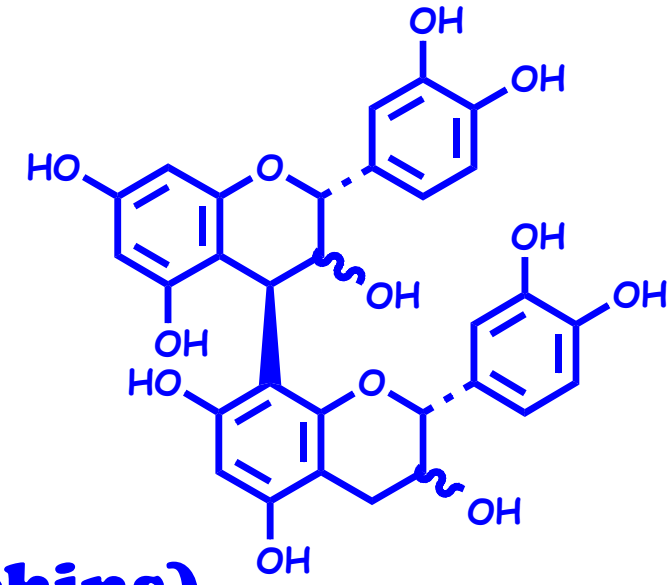
**Black Tea**

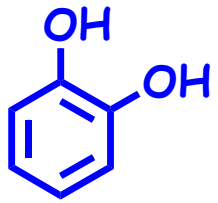
**Green Tea**

# Tea Leaves

## Active constituents

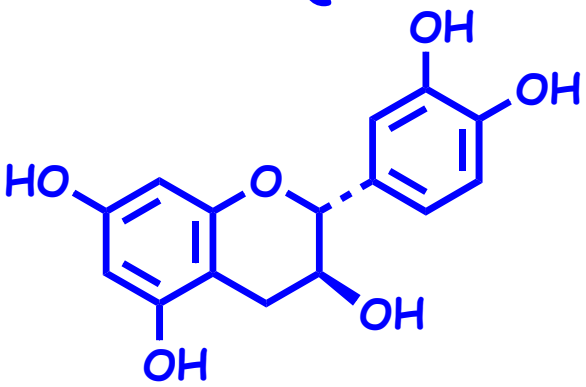
**2- Tannin**
**(10 to 20 %)**
**Catechol type.**



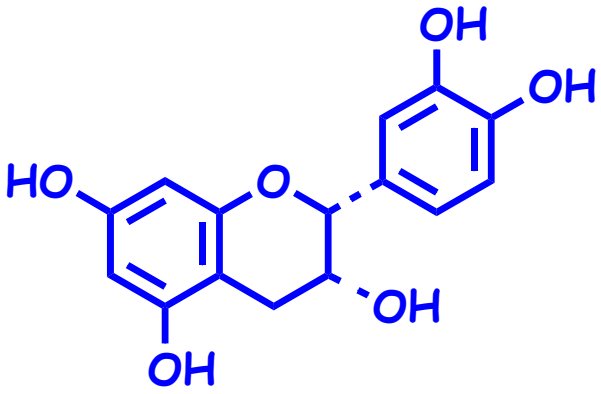


Catechol

**3- Flavonoid (Catechins).**



Catechin



Epi-catechin

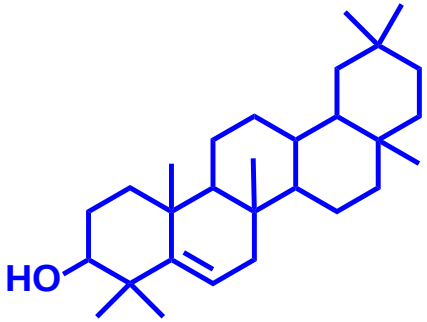
# Tea Leaves

## Active constituents

**4- Volatile oils.**

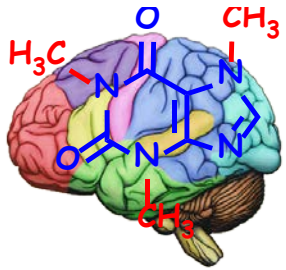
**5- Protein.**

**6- Saponins.**



# Tea Leaves Uses

## Uses




1- CNS Stimulant

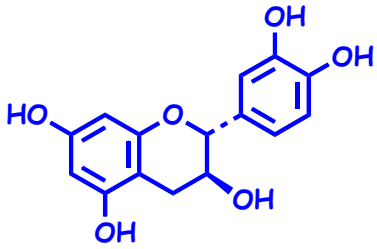

2- Preparation of Caffeine.

Caffeine is used in maigraine


3- Astringent anti-diarrheal.

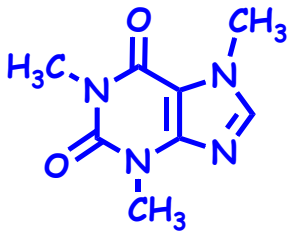
# Uses

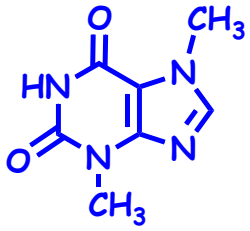
## 4- Antioxidant (Green tea).




Catechin


## 5- Mild diuretic.



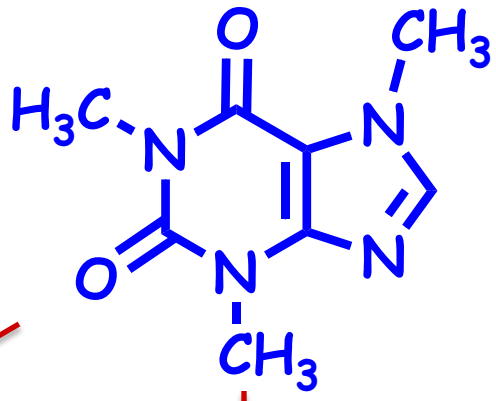





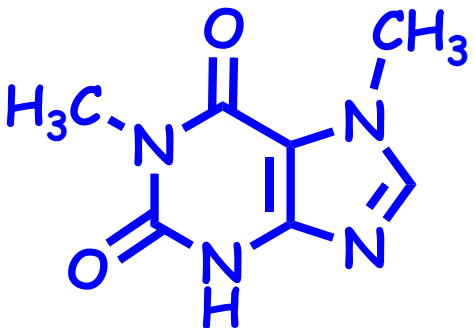
## 6- Control lipid blood level.

# Metabolism of Caffeine

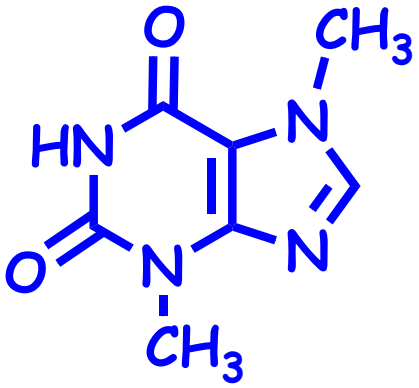
Caffeine



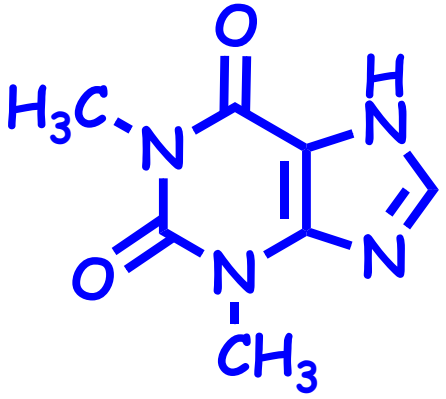
Metabolism in liver



Paraxanthine

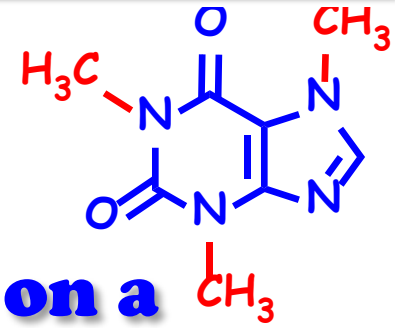


Theobromine



Theophylline

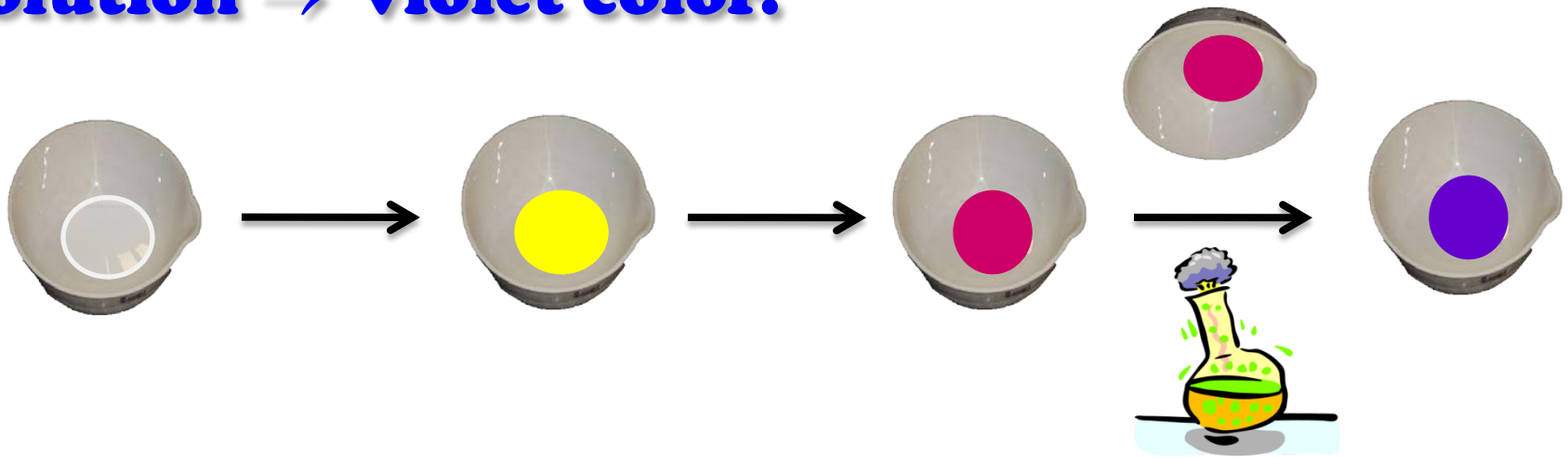
# Test for Caffeine اختبار الكافيين




## Murexide Test

- Evaporate 1 ml of alkaloidal solution on a water bath. Cool, add 2-5 drops conc. HCl + ½ ml $H_2O_2$ → yellow color → crimson red color

- Invert the dish over a container of ammonia solution → violet color.



# Test for Caffeine اختبار الكافيين

## Murexide Test